

REMARKS

The courtesies extended to the undersigned by Examiner Nguyen, during the interview held July 17, 2008 in the subject U.S. patent application, are acknowledged and appreciated. Applicant, his principal representatives in Germany, and the undersigned have carefully reviewed the Final Office Action of April 21, 2008 in the subject U.S. patent application, together with the prior art cited and relied on by the Examiner in the rejections of the claims. In response, the claims have been amended a second time to more clearly patentably define the subject invention over the prior art cited and relied on by the Examiner, without raising new issues and without requiring the Examiner to conduct any additional searching. It is believed that the claims now pending in the application are patentable over the prior art relied on. Reexamination and reconsideration of the application, and allowance of the claims is respectfully requested.

In the Final Office Action of April 21, 2008, the drawings filed with the application were objected to as failing to show the features recited in dependent claims 110, 111 and 127. In order to expedite the prosecution of the subject application, these three claims have been cancelled. While it is believed that the specification of the application, as filed, contains sufficient description of these elements, to allow them to be added to the drawings, applicant is instead cancelling the three claims in order to move the prosecution of the application forward.

In a review of the Substitute Specification, in the course of the preparation of this Amendment, several minor typographical errors were noted. These are being corrected by this Amendment. Their corrections do not constitute any new matter.

Claims 103-127 were objected to as having various informalities. In response, the claims have been reviewed and the informalities noted by the Examiner are believed to have been corrected. It is believed that the claims now pending in the application are in proper form. The Examiner's time, in his reviewing of the claims, and noting the various informalities, is appreciated.

Claims 103, 106-111, 121-123 and 128 were rejected under 35 USC 102(b) as being anticipated by U.S. patent No. 5,947,023 to Bohrer. Claims 104, 105, 112-120, 124-127, 129 and 130 were rejected under 35 USC 103(a) as being unpatentable over Bohrer in view of EP 1,287,987 to Tokiwa. The secondary EP reference has a U.S. patent counterpart, No. 6,679,172 on which further discussion will be based.

As discussed with Examiner Nguyen during the interview held July 17, 2008, the subject application discloses, and claims the use of two signal lines to provide signals to the drive control or regulation units of each of a plurality of motors that drive a large number of printing press components. The general idea of a "virtual shaft" is now well known in the art and relates back to the earlier printing press drive systems that used one main drive shaft. Each of the separate press components, such as printing cylinders, blanket cylinder, inking systems, dampening systems, folders and the like, were all mechanically driven from the single main shaft. Numerous bevel gears and spur gears, together with phase adjustment devices were required.

With the advent of the use of individual drive motors for each press component, there is no longer a need for a physical drive shaft. However, all of the plurality of motors must still be coordinated with each other so that they will join together to form an operational printing press. The concept of a "virtual shaft" is the setting of all of the motors, with respect to each other, using electronics instead of physical shafts.

Each individual motor has to be operated both in concert with all of the other motors and also in its own phase relationship with all of the other motors. In the prior devices, the main shaft was stopped and the phase adjustments of all of the individual rollers and cylinders were made by physically turning the rollers and cylinders. Once the main shaft was engaged, all of the rollers and cylinders were maintained in their appropriate phase relationships because of the physical interaction of the gears and shafts, which would not change.

In the present invention, as summarized in the Substitute Specification at paragraph 035, and as recited in currently pending claims 103 and 128, a higher order control unit 13 and lower order control units 17 are provided. The higher order control unit 13 sends a signal to all of the various motors for all of the press components. This signal essentially puts all of the motors on the same time or phase. In order to provide each motor with its individual offset or phase position, the lower order control unit or units sends specific offset values to each motor. Each motor is provided with its own specific offset value that is unique to it. However, that specific offset value is an offset from the signal that is provided to all of the motors by the higher-order drive control unit. As long as the higher-order drive control unit provides the same master shaft position to all of the various motors and the lower-order control unit or units provide the specific offsets from that master shaft position to each one of the motors, the press assembly will operate properly.

In the prior art, as exemplified by the Bohrer reference, all of the signals were set over the same line. Bohrer recites, at Column 5, starting at line 32, that instead of a longitudinal shaft and various gears and vertical shafts, as seen in Fig. 1, there are provided a control and parameterization bus 42 and a synchronization bus 44. It is the synchronization bus 44 that is the one which is to be compared to the subject invention. The control and parameterization bus 42 is kept strictly separate from the synchronization bus 44, as recited at Column 5, lines 54 and 55. The synchronization of the various drive motors, in accordance with the teachings of the Bohrer reference, are accomplished, as set forth at Column 6, lines 19-23. The individual position setpoint of each cylinder is defined for each drive by a machine control device 50, as discussed at Column 6, lines 4 and 5. That device uses the synchronization bus 44 to synchronize the individual drive units of the various printing stations to each other. This is done by the provision of an angle value of a control vector, plus an individual offset angle for each drive. In other words, the synchronization bus 44 of the prior art Bohrer reference uses a single bus 44 to combine the two signals provided by the two separate lines of the subject invention.

As discussed with Examiner Nguyen, there is a significant benefit to the system of the present invention, as compared to the prior art, as typified by the Bohrer reference. In the Bohrer device, the synchronization bus 44 has to carry both signals to all of the motors. Each signal consists of the setpoint plus an individual offset angle for each drive. If there were only a few motors, the signals could be repeated on a relatively frequent basis. With the presence of a large number of motors, each of which has to receive a combined signal that includes the angle of a control vector, plus an individual offset angle for each individual motor, the numbers of signals that the synchronization bus 44 can handle has an upper limit.

In contrast, in the device in accordance with the subject invention, as recited in currently amended claim 103, and in the method in accordance with the subject invention, as recited in currently amended claim 128, there are provided two separate lines. The first one of these is connected to a higher-order control unit that provides the machine shaft position to all of the various motors. This is the starting point for all of the individual positional offsets that are supplied to each one of the motors or to their motor regulation units, by the lower-order control unit through a separate second signal line. The division of the master shaft position signal and the individual offset signals into two separate control lines means that the first signal line, which is tasked with providing the master shaft position from the higher-order control unit, is not encumbered by also being required to carry all of the individual offset values to all of the individual motors. This means that, with a large number of drives to be synchronized, the resolution rate of the master shaft position signal can be kept high by sending the single signal to all of the individual drive motors at a much higher repetition rate. Since the master shaft position for all of the individual motors, as provided by the higher-order control unit, through the first line is not encumbered by the individual offset values, it can be repeated much more frequently with a resultant increase in the synchronization of all of the large number of motors or of their drive regulation units. The individual offsets are sent through the separate second line and do not interfere with the master shaft position.

Claim 103 has been amended to more clearly patentably define the subject matter of the present invention. It is believed that claim 103 is now clearly not anticipated by the prior art Bohrer reference. The provision of two separate signal lines, for two separate purposes, as recited in currently amended claim 103, is directly opposite to the teaching of the prior art Bohrer reference. The Office Action notes the existence of the control unit parameterization bus 42 of Bohrer. As noted above, that bus 42 is not at all associated with the synchronization bus 44. It does not provide, or suggest the second signal line, as recited in claim 103, as amended. The purpose of the control unit parameterization bus 42 of Bohrer is not related to the synchronization of the motors. It is not relevant to the device recited in claim 103.

Claim 128 has been amended in a manner similar to claim 103. It recites the method of driving a web-fed rotary printing press using the structure set forth in claim 103. Claim 128 is thus also not believed to be anticipated by the Bohrer reference. The Bohrer reference discloses, at the bottom of Column 7 and the top of Column 8, the provision of two synchronization buses 44. This is however a redundant system that is usable to control a motor using a second bus 44 if the first bus 44 should fail. Each of the two buses 44 is exactly the same. Each carries both the master angle value of a control vector and an individual offset angle for each drive. Bohrer simply does not disclose or anticipate the use and provision of two separate lines, as disclosed and claimed in the subject application.

The secondary reference to Tokiwa, U.S. patent No. 6,679,172 does not provide the teachings of the subject invention, as recited in claims 103 and 128, that are missing from the Bohrer reference. Initially, the assertion in the Office Action, that Bohrer shows a higher-order control unit to generate the master shaft position and a lower-order control unit for each of the separate drive motors is not believed to be relevant. The control device 50 of Bohrer is a higher level than the drive units. However, that does not provide any teachings of the use of two separate lines to provide two signals to each drive regulation unit. In Bohrer, one line is used to provide both the master shaft position and the individual angular offset.

The secondary reference to Tokiwa is directed to a control apparatus and to a method for automatically changing plate cylinders in a rotary printing press. It stops and starts in separate printing cylinders based on print counts. The several control sections depicted in Fig. 3 of Tokiwa are directed to control and parameterization of the motors in the various portions of the printing press. There is no discussion in this secondary reference of the use of a master shaft position and of individual angular or phase position offsets. There is also no discussion of the use of separate first and second signal lines, as recited in the claims of the subject application.

The claims reciting features not shown in the drawings have been cancelled in an effort to advance the prosecution of the subject application. Claim 130 has also been cancelled. All of the claims remaining in the application depend either from believed allowable independent claim 103 or from believed allowable independent claim 128. These claims are thus also believed to be allowable.

SUMMARY

Independent claims 103 and 128 have been amended. Independent claim 130, as well as several of the dependent claims, have been cancelled. It is believed that the claims now pending in the application are allowable. It is further believed that this Amendment After Final Rejection is an earnest effort to place the application in condition for allowance without raising any new issues and without requiring the Examiner to conduct additional searching. Entry of this Amendment into the application, allowance of the claims, and passage of the application to issue is respectfully requested.

Respectfully submitted,

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